

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
11 March 2004 (11.03.2004)

PCT

(10) International Publication Number  
**WO 2004/020985 A1**

(51) International Patent Classification<sup>7</sup>: **G01N 21/55,**  
21/77

(21) International Application Number:  
PCT/GB2003/003803

(22) International Filing Date:  
2 September 2003 (02.09.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0220341.2 2 September 2002 (02.09.2002) GB  
0309927.2 30 April 2003 (30.04.2003) GB

(71) Applicant (for all designated States except US): **MEDICAL BIOSYSTEMS LTD.** [GB/GB]; The Old Mill, Beaston Cross, Broadhempston, Nr. Totnes, Devon TQ9 6BX (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DENSHAM, Daniel, Henry** [GB/GB]; The Old Mill, Beaston Cross, Broadhempston, Totnes, Devon TQ9 6BX (GB). **ALIEVA,**

**Elena** [RU/GB]; Mobious Genomics Ltd., Innovation Centre, University of Exeter, Rennes Drive, Exeter EX4 4RN (GB). **GUREVICH, Leonid** [RU/GB]; Mobious Genomics Ltd., Innovation Centre, University of Exeter, Rennes Drive, Exeter, EX4 4RN (GB). **JERDEV, Artem** [RU/GB]; Mobious Genomics Ltd., Innovation Centre, University of Exeter, Rennes Drive, Exeter, EX4 4RN (GB). **KONOPSKY, Valery** [RU/GB]; Mobious Genomics Ltd., Innovation Centre, University of Exeter, Rennes Drive, Exeter, EX4 4RN (GB).

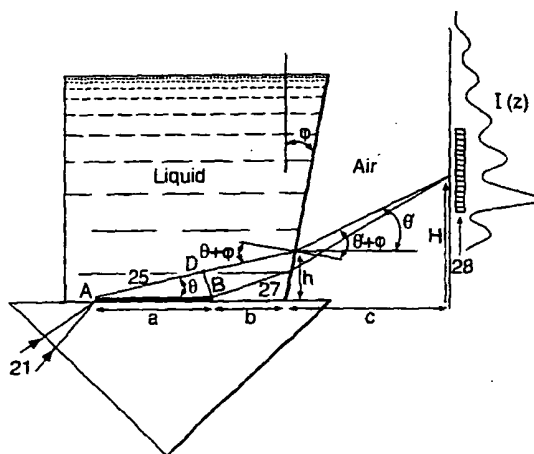
(74) Agent: **GILL JENNINGS & EVERY**; Broadgate House, 7 Eldon Street, London EC2M 7LH (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: **BIOSENSOR**



(57) Abstract: The present invention relates to a system and method for detecting a physical, chemical or biochemical reaction. The system of the present invention comprises a coherent radiation source for producing an incident wave (21); a carrier surface (AB) for supporting a specimen to be analysed, the carrier surface mounted on a substrate and capable of supporting surface electromagnetic waves (SEW); means for splitting the incident wave into an SEW and a first scattered wave (25), wherein the SEW propagates along the carrier surface and interacts with the specimen; means for generating a second scattered wave (27) from the SEW; and, a detector (28) for monitoring the interference between the first scattered wave and the second scattered wave. The invention also relates to carrier surfaces for use on the system. A carrier chip according to the present invention comprises a dielectric substrate; and a conductive film formed on the surface of the substrate suitable for carrying the specimen; wherein the conductive film comprises first means for splitting an incident wave into a first scattered wave and a surface electromagnetic wave (SEW), the SEW propagating along the carrier surface and interacting with the specimen, and a second means for generating a second scattered wave from the SEW.



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,  
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— with international search report